AMENDMENTS TO THE CLAIMS

1 (Cancelled)

2 (Currently Amended): A communication satellite using beam hopping to reach multiple terrestrial cells in a beam laydown pattern, the satellite comprising:

means for receiving packets of uplink data for transmission through multiple downlink beams to multiple hop locations corresponding to multiple terrestrial cells;

a multiple beam downlink antenna comprising a plurality of radiating elements, each of which Is responsible for generating an independently controllable downlink beam to one of an equal plurality of terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region;

a self addressed packet switch for routing uplink data packets to a memory, wherein each uplink data packet contains destination information; and

means for controlling selection of downlink beams in a beam hopping manner, including a switch that directs a waveform derived in part from each uplink data packet to a selected radiating element of the multiple beam downlink antenna in response to a hop selection signal derived from the destination information in the packet;

wherein the multiple beam downlink antenna directs the waveforms derived from the uplink data packets, by beam hopping to the appropriate destination terrestrial cells;

wherein the switch also provides a color control signal to each downlink beam, to minimize interference between downlink channels;

~~The communication satellite of claim 1,~~ and wherein the memory comprises queues assigned to respective hop locations.

3 (Currently Amended): A communication satellite using beam hopping to reach multiple terrestrial cells in a beam laydown pattern, the satellite comprising:

means for receiving packets of uplink data for transmission through multiple downlink beams to multiple hop locations corresponding to multiple terrestrial cells;

a multiple beam downlink antenna comprising a plurality of radiating elements, each of which is responsible for generating an independently controllable downlink beam to one of an equal plurality of terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region;

a self addressed packet switch for routing uplink data packets to a memory, wherein each uplink data packet contains destination information; and

means for controlling selection of downlink beams in a beam hopping manner, including a switch that directs a waveform derived in part from each uplink data packet to a selected radiating element of the multiple beam downlink antenna in response to a hop selection signal derived from the destination information in the packet;

wherein the multiple beam downlink antenna directs the waveforms derived from the uplink data packets, by beam hopping to the appropriate destination terrestrial cells;

wherein the switch also provides a color control signal to each downlink beam, to minimize interference between downlink channels;

~~The communication satellite of claim 1,~~ and wherein the memory comprises queues distinguished by beam hop location and priority.

4 (Original): The communication satellite of claim 3, wherein the memory comprises queues further distinguished by a code rate.

5 (Original): The communication satellite of claim 4, wherein the queues are distinguished by a plurality priorities, a plurality code rates, and a plurality hop locations.

6-8 (Cancelled)

9 (Previously Presented): A beam hopping data routing subsystem for a communication satellite, the subsystem comprising:

means for receiving packets of uplink data for transmission through multiple downlink beams to multiple hop locations corresponding to multiple terrestrial cells;

an inbound module accepting demodulated uplink data, the inbound module including a routing table that stores queue tags specifying downlink beam hop locations for the uplink data;

a switch having an input port coupled to the inbound module;

an outbound module coupled to an output port of the switch, the outbound module including a memory for storing the uplink data according to the downlink beam hop locations; and

a multiple beam array antenna coupled to the outbound module, the multiple beam array antenna comprising a plurality of feed elements assigned to respective downlink beam hop locations, wherein the downlink beam hop locations correspond to an equal plurality of terrestrial cells that are contiguously arrayed in a beam laydown pattern covering a terrestrial region;

and wherein the data routing subsystem further comprises means for routing downlink data retrieved from the memory of the outbound module to appropriate feed elements of the multiple beam array antenna, to direct the downlink data to required downlink hop locations.

10 (Previously Presented): The data routing subsystem of claim 9, wherein the feed elements are feed horns.

11 (Original): The data routing subsystem of claim 9, wherein the queue tag further specifies code rate for the uplink data.

12 (Original): The data routing subsystem of claim 11, wherein the queue tag further specifies priority for the uplink data.

13 (Original): The data routing subsystem of claim 9, wherein the routing table additionally stores routing tags indicative of at least one switch output port.

14 (Original): The data routing subsystem of claim 9, wherein the routing table is addressed with an address included in the uplink data.

15 (Original): The data routing subsystem of claim 14, wherein the address is at least one of a VPI and VCI field in an ATM cell.

16 (Original): The data routing subsystem of claim 15, wherein the routing additionally stores a replacement address for the uplink data.

17 (Previously Presented): A method for communicating data through a communication satellite that uses beam hopping to reach multiple terrestrial cells in a beam laydown pattern, the method comprising:

receiving packets of uplink data for transmission through multiple downlink beams to multiple hop locations corresponding to multiple terrestrial cells;

looking up a memory queue indicative of hop location using an address included in each uplink data packet.

storing the uplink data packets in the memory queue;

retrieving the uplink data packets and preparing for each a waveform to be transmitted;

selecting a feed path for each waveform according to the hop location;

selecting a color control signal for each downlink beam, to minimize interference between downlink channels and

transmitting the waveforms using beam hopping in a multiple beam downlink antenna; wherein the step of selecting a feed path for each waveform effectively hops transmission from one downlink beam to another.

18 (Previously Presented): The method of claim 17, wherein looking up comprises looking up a queue tag for each uplink data packet.

19 (Previously Presented): The method of claim 18, wherein the step of looking up further comprises looking up a queue tag specifying the priority for each uplink data packet.

20 (Previously Presented): The method of claim 19, wherein the step of looking up further comprises looking up a queue tag specifying a code rate for each uplink data packet.

21 (Previously Presented): The method of claim 17, further comprising the steps of looking up a routing tag for each uplink data packet and switching the uplink data packet to the memory using the routing tag.

22 (Original): The method of claim 17, wherein selecting a feed path comprises switching a ferrite switch.